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book and the collection comprise the first portion of a course in mineralogy which has been arranged for the use of the Agassiz associations throughout the country. The price of the pamphlet and the twenty-five minerals which it describes is one dollar.—The principal formal and optical characteristics of the more important rock-forming minerals have been arranged by Rosenbusch¹ in sets of tables covering about twenty-five pages. The tables are of great convenience to students who are far enough advanced in the study of petrography to understand the significance of the terms used in them.

BOTANY.²

NOTES ON NEBRASKA LICHENS.—Our knowledge of the Lichen Flora of Nebraska is as yet very meager being confined principally to the work of Hayden and Hall during the Government Geological Surveys. Our knowledge, such as it is however, shows that our Lichen Flora has many interesting as well as instructive characteristics. There is a general dearth of the large eastern forms throughout the greater part of the state. There are, however, along the Missouri river and its tributaries, many forms that are found in the eastern states. The Flora of this region serves as a connecting link between the timber forms of the East and the prairie forms of the West. The prairie region has an abundance of earth forms such as *Endocarpon*, and many *Buellias* and *Biatoras*.

Many semi-mountain and mountain forms occur in the western and northwestern parts of the state. Beginning with the eastern border of the state and going west a gradual transition from timber forms to earth forms, is observable; and from these to the forms usually found in higher altitudes as *Umbilicaria*, *Omphalaria*, and similar forms.—*T. A. Williams*.

AS TO THE CITATION OF AUTHORITIES.—That the effects of individual eccentricity when given room for free development are always striking, is well shown by the diversity of methods used by botanists in giving authorities for scientific names. In the good old days when but one name, that of the author of the combination, was cited, there was, at least, uniformity and hence some certainty. But the later method

¹ Hülftstabellen zur Mikroskopischen Mineralbestimmung in Gesteinen. Stuttgart, 1888.

² This department edited by Dr. C. E. Bessey, Lincoln, Neb.

of citing the author of the specific name and especially the introduction of the parenthesis has resulted in a confusion which is certainly "enough to throw a strong man into blue convulsions." The advantage of the old method is its simplicity. The common objection to it is that it does not give any credit to the author of the specific name. But credit and glory are not the objects in citing authorities; surely it is not the only office of the parenthesis to serve as a sarcophagus in preserving the names of botanists who might otherwise be forgotten. The true purpose is accuracy in determining the species meant. Plants are continually being described under names already occupied, and unless the name of the author is given it is impossible to know what species is meant. Now if one of two plants bearing the same name is put in another genus how, unless the authority is cited, is one to know whether it is a new species or one of the original two, and if so which? On this account it is a great convenience to have the name of the author of the specific name given also. There are several ways of doing this. Some cite the author of the specific name even after the genus has been changed, as if he were the author of the combination, *e. g.* "*Hypoxylon colliculosum* Schw"—Rav. Fung. Am. No. 742. (for *H. colliculosum* (Schw.) Nits.) No worse method could be thought of. According to this *Sphæria colliculosa* Schw and *Hypoxylon colliculosum* Schw" are evidently two distinct things and some investigation is of course necessary to establish their unity. Schweinitz did not make the combination *Hypoxylon colliculosum*, and to cite him for it is confusing and absurd. A slightly better method is to give the name of the author of the specific name in a parenthesis omitting that of the author of the combination, *e. g.* "*Puccinia phragmitis* (Schum.) Winter Pilze 179. This should be *P. phragmitis* (Schum.) Körnicke. But many, misled by the omission of a name after the parenthesis, have written *P. phragmitis* (Schum.) Wint., and then *P. phragmitis* Wint. while on the other hand we find *P. phragmitis* Körn. In a large genus of intricate synonymy like *Puccinia* how is one without investigation to know that all these are the same? Another very peculiar method has recently broken out which it is to be hoped will not get abroad; that is, to put the name of the author of the combination in a parenthesis after that of the author of the specific name thus: "*Hicoria alba* L. (Britt.). Bull. of Washb. Coll. Vol. II, No. 9. This of course if it gains any foothold will give rise to all manner of false citations.

There are only two methods which can be used without making endless trouble and confusion. If but one authority is to be cited, give the author of the combination. Consider accuracy and convenience rather than glory and justice so-

called. If two are to be given, place the name of the author of the specific name in a parenthesis, and that of the author of the combination following, and outside. If, in this case, it seem strange to cite a botanist as an authority for a name he did not know, still it is in many cases the best way. For example, in the case of *Lactarius plumbeus* Fr. ; if this is written *L. plumbeus* (Bull.) Fr., one knows that it is *Agaricus plumbeus* Bull. not *A. plumbeus* Schaeff. nor *Mycena plumbea* Fr. Again, *Uropyxis petalostemonis* De Ton. scarcely seems familiar. But any one can recognize in *U. petalostemonis* (Farl.) D. Ton., *Puccinia petalostemonis* Farlow. It may also be objected to this method, that in many cases it merely perpetuates worn out synonymy. But it is the only one which causes no confusion and indicates exactly the species meant.—*Roscoe Pound.*

A QUESTION REGARDING THE APPLICATION OF THE LAW OF PRIORITY.—The strict application of the law of priority to botanical nomenclature, raises several interesting questions. One of them is whether a specific name of the same etymology and meaning with its generic name should be retained. There seems no good reason why it should not, as long as they are not identical. Indeed botanists are doing this in the names of many Phanerogams, *e. g.* *Echinocystis echinata* (Muhl) and *Larix laricina* (D. R.). The author of these combinations gives *Specularia speculum* D. C., as a precedent, and *Arctostaphylos uva ursi* (L) is almost another. Among the Fungi there is *Fomes fomentarius*. There are two Fungi which offer excellent opportunities for doing the same, namely ; *Ramularia didyma* Ung. and *Cylindrium septatum* Bon. Saccardo gives these as *Didymaria ungeri corda* and *Septocylindrium bonordenii* Sacc. But strictly according to the law of priority they should be *Didymaria didyma* (Ung.) and *Septocylindrium septatum* (Bon.) However strange these combinations appear, it would seem better as the great majority of specific names are arbitrary and without particular application, to apply the law of priority uniformly, than to make an exception for so slight a cause.—*Roscoe Pound.*

OF GENERIC AND SPECIFIC NAMES TOO NEARLY ALIKE.—Saccardo (in a note in *Syl. Fung.* V. p. 474) in commenting upon Winter's change of *Cercospora pulvinulata* Sacc. & Wint. to *C. missouriensis* Wint. on account of *C. pulvinulus* C. & E. reproaches him with admitting *Nitzschia* and *Nitschkia*. Saccardo changes the latter to *Cælosphæria* on account of

its similarity to the former—a genus of Algæ. This led me to investigate some of the names which Saccardo himself admits. He allows without hesitation *Libertella* Desm. and *Libertiella* Speg and Roum; *Licea* Schrad., and *Lisea* Sacc.; *Dichaena* Fr. and *Dichlaena* D. and M.; *Pleospora* Rabh. and *Phleospora* Wallr.; *Entoloma* Fr. and *Entyloma* D. B.; *Riessia* Fres. and *Reessia* Fisch. and *Eriosphaera* Reich. and *Eriosphæria* Sacc. Whether or not these are too nearly alike depends upon the taste and pronunciation of those who use them. To one using the English pronunciation, *Licea* and *Lisea* are indistinguishable. Besides these he admits many which are very much alike, but more defensible, as *Arthrobotryum* and *Arthrobotrys*, *Urospora* and *Urosporium*. He retains *Antennaria* Lk. in spite of *Antennaria* Gærtn., and even gives under the genus *Marasmius* the sections *Collybia* and *Mycena*, although there are the genera *Collybia* and *Mycena* in the same family.

As regards specific names: he necessarily admits many which are very similar as *pulvinula* and *pulvinulata*, *flavus* and *flavidus*, etc. In a large genus, new specific names are rather hard to get and one ought not to be too sensitive. But are not the following too nearly alike: *Puccinia penstem onum*, Lev. and *P. pentstemonis* Pk; *P. schileana* Speg. and *P. scheliana* Thuem; *P. scleroteoides* Mont. and *P. sclerotioidea* Cooke? The following in Vols. III. and IV. are certainly indefensible: *Phoma pini* C. and Hark. and *P. pini* Sacc.; *Phyllosticta viticola* Thuem and *P. viticola* Sacc. and Speg. *Zygodemus ochraceus* Corda and *Z. ochraceus* Sacc., *Cladotrichum fuscum* Poeuss and *C. fuscum* (Grev) Sacc.; *Cercospora fumosa* Pewz. and *C. fumosa* Speg. These and some others in the two volumes mentioned have been corrected, but in such out of the way places that very few would notice them. Those in Vol. III. are corrected in a note at the close of the index; those in Vol IV. in a similar note mixed in with corrections of typographical errors. For this reason I have given them. The following from Vols. V. and VI. have not, as far as I can find, been corrected: *Polystictus stereoides* Fr., and *P. stereoides* Berk., *Fomes calignosus* Ces., and *F. calignosus* Berk., *Clavaria cervina* B. & C., and *C. cervina* Sm., *Polystictus cinerescens* Schw. and *P. cinerescens* Lev., *Stereum concolor* Jungh., and *S. concolor* Berk., *Clavaria coronata* Schw. and *C. coronata* Zipp., *Cyphella ravenelii* B. & C. and *C. ravenelii* Sacc. This last he substitutes for *C. fulva* B. & C. to avoid *C. fulva* B. and Br. But the worst of all is in the genus *Polyporus* where there is, No. 303, *Polyporus armeniacus* Berk. Engl. Flor. V. 147. and also No. 215, *P. armeniacus* Berk. Hook. Journ. 197.—*Roscoe Pound.*

SOME EXPERIMENT STATION BOTANY.—A dozen or so of the bulletins issued by the Agricultural Experiment Stations contain matter more or less botanical in nature. From these the following notes have been rather summarily made.

In Dakota the growth of planted trees during the two years 1886 and 7 was watched and noted.—In Missouri forty "varieties" of grasses were grown and their deportment noted under certain local conditions.—In Kansas the observations upon grasses and clovers extending through fourteen years have been summarized and recorded in Bulletin No.2.—In Florida, the grasses have been grown and watched in like manner.—In Indiana, Professor J. C. Arthur (in Bulletin 15) describes popularly, but accurately, the structure of the potato tuber. The treatment of the subject is admirable and aside from its horticultural value the paper is of value and interest to botanists.—In Minnesota the Bulletin for July, contained a popular account of the organs of fertilization in plants with especial reference to the artificial pollination of cultivated plants.—The August bulletin of the Iowa station contained an interesting paper on corn tassels and silks, and a popular discussion of grasses and other forage plants. Mr. Crozier's notes upon the wild grasses of Northwestern Iowa are valuable, although some of the English names used by him are misleading and confusing. "Blue Stem" for *Agropyrum glaucum* and "Buffalo Grass" for *Bouteloua oligostachya* ought not to be tolerated.—In Texas, Bulletin 3 is devoted to popular notes on native and introduced grasses and other forage plants.—Bulletin 4, of the Minnesota station, devotes sixteen pages to "Fungi which kill insects," by Otto Lugger. The paper is a well written summary derived from various sources, with observations by Mr. Lugger, and is illustrated by nine cuts two of which are original.—The November bulletin, from the Iowa station, includes a short paper by C. P. Gillette on Chinch-bug Diseases (*Empusa* sp. and *Micrococcus insectorum*) and "Some Injurious Fungi" by Mr. Crozier. The latter are Apple Blight, (*Micrococcus amylovorus* Burrill.) Potato Rot (*Phytophthora infestans* DeBary,) Grape Rot (*Læstidia bidwillii* Sacc) and Ergot, (*Claviceps purpurea* Tul.) Mr. Craig contributes some notes on Promising Grasses of Montana, and Idaho, based upon personal observations made during a hasty trip taken at the suggestion of the Governing Board of the station.—In New Jersey, Mr. Hulst reprints at length from Worthington Smith's account in "Diseases of Field and Garden Crops," of Club-Root (*Plasmodiophora brassicæ* Wor.) Some personal observations are added.—Professor Kellerman makes a preliminary Report on Sorghum Blight (*Bacillus sorghi* Burrill) in the December bulletin

of the Kansas station.—Otto Lugger in the January Bulletin of the Minnesota station, publishes a paper on “Frosted and Rusted Wheat,” apparently being for the most part a compilation from various sources.—The Spotting of Peaches and Cucumbers is treated by Professor Arthur in the January Bulletin from the Indiana station. The disease on peaches is caused by *Cladosporium carpophilum* Thuem, and that on Cucumbers by *Cladosporium cucumerinum* E. & A. Figures are given of various stages of the fungi.

BACTERIOLOGY.¹

THE BACTERIA OF SNOW.²—In many countries, during several months, snow forms the natural covering of the earth. Waste materials of all sorts, which collect in houses, etc., in many villages and small cities are thrown out directly upon the earth, and in the winter the snow takes the place of the earth in receiving and absorbing contaminating matters. In the spring, the water from the melting snow makes its way into the earth, carrying with it various impurities, some of which may be pathogenic. Whether any change takes place in them during the long time the snow lies upon the earth or whether they enter the earth unchanged, is a question of much importance.

According to the author of this paper, at the time of his writing, there was little or no literature concerning the bacteriology of snow. A number of investigators too, had worked on ice, but no where could he find any reports of examinations of snow. It remained uncertain whether its long stay on the earth changes the number or the character of the bacteria contained in it.

In the bacteriological examination of snow, it is obviously of first importance to secure it pure and free from accidental impurities, as it is often found, for example, on a large clear expanse. As it was evident that there would probably be a difference between snow which had lain long on the earth and freshly-fallen snow, the author made investigations of both kinds. Of fresh snow, some was caught, while falling, during

¹ This Department is edited by Prof. Wm. T. Sedgwick, of the Mass. Institute of Technology, Boston, Mass., to whom brief communications, books for review, etc., should be sent.

² “Ueber den Bakteriengehalt des Schnees,” von Th. Janowski. *Centralblatt für Bakteriologie* IV, 547.